ONTARIO MINISTRY OF ENVIRONMENT
36936000023349

OPERATING SUMMARY

1972

CONISTON

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MINISTRY
ENVIRONMENT

TD
367
.A56
C665
1972
MOE

TD
367
.A56
C665
1972

Coniston : water pollution
control plant.

81532

Ontario

Ministry of the
Environment

135 St. Clair Avenue West
Toronto 195, Ontario

We are pleased to present you with the 1972 operating summary for the water pollution control plant serving your community.

This summary contains data on the performance of the plant as well as relevant financial information. Of particular interest is the review of the year's activities in which significant items of these data are discussed in some detail by the operations engineer and his staff who, by their day-to-day involvement with the operation, are thoroughly familiar with the plant.

We appreciate your continuing interest in protecting the environment through the efficient operation of this wastewater treatment facility.

D.S. Caverly,
Assistant Deputy Minister.

D McTavish

D.A. McTavish, P. Eng.,
Director,
Project Operations Branch.

TD
227
C66
W38
1972
MOE

nsf

MINISTRY OF THE ENVIRONMENT

MINISTER
Honourable James A.C. Auld

DEPUTY MINISTER
E. Biggs

ASSISTANT DEPUTY MINISTER
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EXECUTIVE DIRECTOR
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PROJECT OPERATIONS BRANCH

DIRECTOR
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ASSISTANT DIRECTOR
C.W. Perry

REGIONAL SUPERVISOR
P.J. Osmond

OPERATIONS ENGINEER
J. Wesno

135 St. Clair Avenue West
Toronto 195

CONISTON

WATER POLLUTION CONTROL PLANT

operated for

THE TOWN OF CONISTON

by the

MINISTRY OF THE ENVIRONMENT

1972 ANNUAL OPERATING SUMMARY

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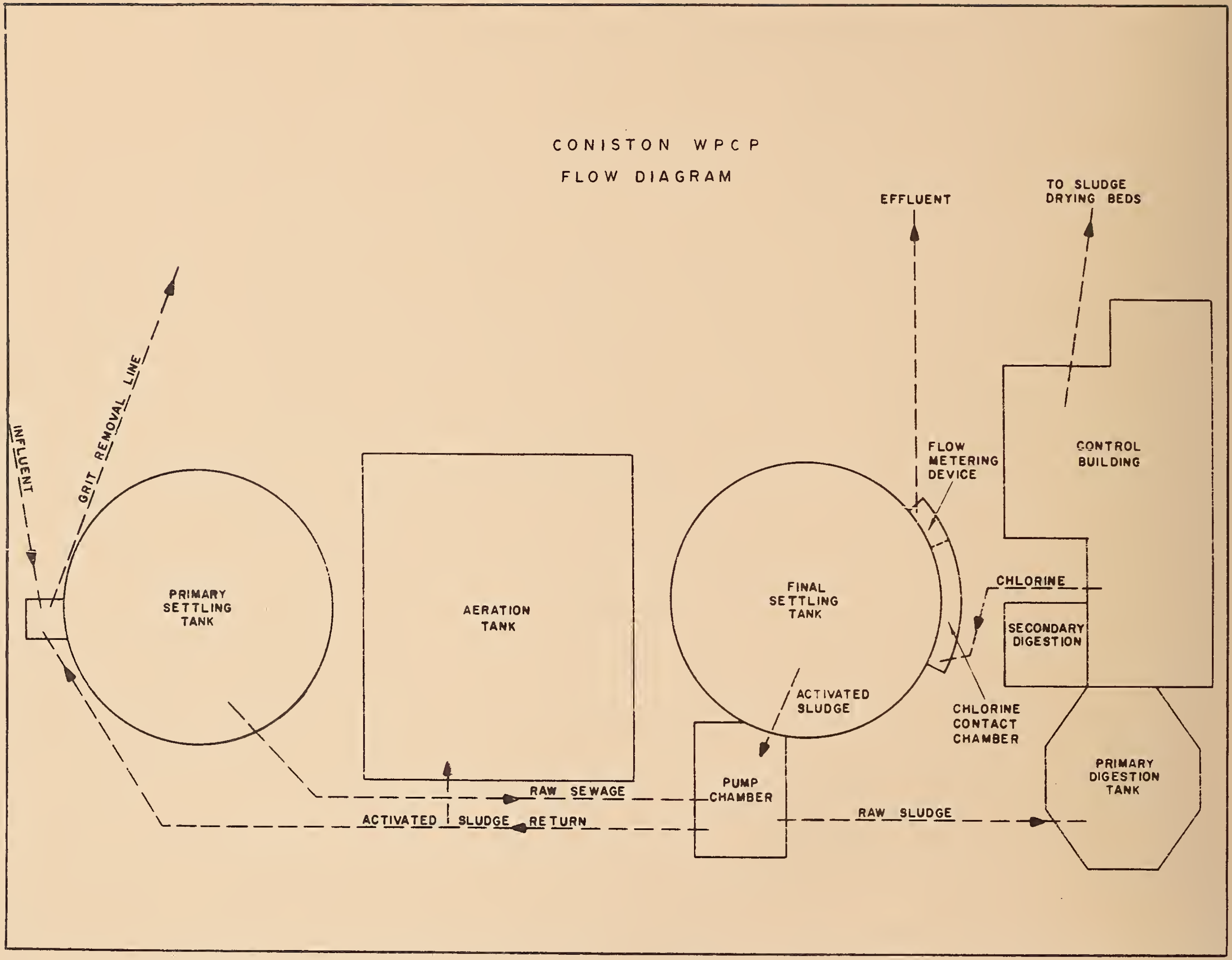

CONISTON WPCP
FLOW DIAGRAM
EFFLUENT
TO SLUDGE DRYING BEDS
INFLUENT
GRIT REMOVAL LINE
PRIMARY SETTLING TANK
AERATION TANK
FINAL SETTLING TANK
FLOW METERING DEVICE
CONTROL BUILDING
CHLORINE
SECONDARY DIGESTION
ACTIVATED SLUDGE
CHLORINE CONTACT CHAMBER
PUMP CHAMBER
PRIMARY DIGESTION TANK
RAW SEWAGE
ACTIVATED SLUDGE RETURN
RAW SLUDGE

DESIGN DATA

PROJECT NO.		2-0008-57
TREATMENT		Activated Sludge
DESIGN FLOW		
	Primary	0.260 mgd
	Secondary	0.150 mgd
DESIGN POPULATION		2,500
BOD	- Raw Sewage	200 mg/l
	- Removal	93%
SS	- Raw Sewage	250 mg/l
	- Removal	93%

PRIMARY TREATMENT

Screening & Grit Removal

- in influent chamber

Primary Sedimentation

Type: Neco with helical scraper
Size: One 24' dia x 5.7' (18,400 gal)
Retention: 2.94 hr
Loading: Surface, 332 gal/ft^2/day
(@ 0.26 mgd) Weir, 1.700 gal/ft/day

SECONDARY TREATMENT

Aeration Tanks

Type: Mechanical aeration, single-pass
Size: One 29' x 29' x $15\frac{1}{2}'$ (55,800 gal)
Retention: 8.9 hr

Aerator

Type: Ames-Crosta
Size: One 6' dia

Secondary Sedimentation

Type: Ames-Crosta Type F
Size: One 28' dia x $6\frac{1}{2}'$
Retention: 4 hr
Loading: Surface, 572 gal/ft^2/day
(@ 0.15 mgd) Weir, 720 gal/ft/day

CHLORINATION

Type: W & T Type A678

Chlorine Contact Chamber

Retention: 10 min

OUTFALL

- 10" Transite to creek

SLUDGE HANDLING

Digestion System

Type: Two-stage

Primary --
One concrete fixed roof octagonal tank with 12" Ames-Crosta screw pump
Size: 19' 3" x 14' swd (4640 ft^3 or 29,000 gal)

Secondary --
One concrete tank with plank roof
Size: 10' x 10' x 8' swd (920 ft^3 or 5,700 gal)

Drying Beds

Six beds 20' x 30'

'72 Review

GENERAL

This project originally consisted of a 0.15 mgd secondary treatment plant, a sewage collector system and five lift stations.

In November, 1972 an extended aeration plant was put into operation increasing the total treatment capacity to 0.35 mgd. Two of the five lift stations were removed from service with a third to be taken out in 1973. The three stations are replaced by a custom built station located in the centre of Town.

EXPENDITURES

The operating cost for the complete project was $24,077.14 and represents an increase of 20.3 percent over the previous year.

PLANT FLOW AND CHLORINATION

The total flow to the end of September was 70.98 million gallons which gives an average daily flow of 260,000 gallons. Using this average flow the total year's flow is estimated at 95.16 million gallons. An estimate is necessary as the flow meters for the new portion of the plant were not completely operable until early 1973. The average daily flow in 1971 was lower at 220,000 gallons.

The final effluent was chlorinated from May 3 to September 30 and required the use of 2259 pounds of chlorine at an average dosage of 5.8 mg/l.

PLANT EFFICIENCY

The raw sewage average BOD and suspended solids concentrations were 151 mg/l and 179 mg/l respectively. This represented a decrease of 32 percent for BOD and 7 percent for suspended solids from the previous year.

The average final effluent BOD concentration was 54 mg/l and suspended solids was 70 mg/l. This represents an average reduction of 64 percent for BOD and 61 percent for suspended solids. An efficient secondary treatment plant should achieve about 90-95 percent BOD and suspended solids removed.

AERATION

The average MLSS concentration was 848 mg/l and the average BOD loading to the aeration section was 181 mg/l. The average organic loading on the aeration section was 2.3 pounds BOD/day per pound of MLSS (F/M ratio).

SLUDGE DIGESTION AND DISPOSAL

An estimated 56,300 gallons of raw sludge was pumped to the digester and 39,300 gallons of digested sludge was removed from the digester to the drying beds. A total of 120 cubic yards of sludge was hauled from the drying beds and a total of 45 cubic yards was hauled from the digester.

CONCLUSIONS

During the year flows continued to be in excess of the design capacity until the start up of the new oxidation ditch in November. From that time on, there was a marked improvement in the effluent quality.

PROJECT COSTS

NET CAPITAL COST	$468,190.39
DEDUCT - Portion financed by	
Long Term Debt to MOE	$468,190.39

Debt Retirement Balance at Credit (Sinking Fund) December 31, 1972	$171,456.87

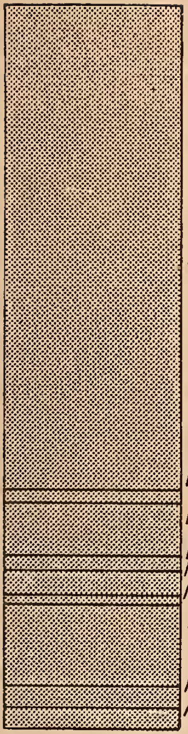
Net Operating	$ 24,154.94
Debt Retirement	3,457.00
Reserve	1,969.03
Interest Charged	26,255.63
TOTAL	$ 55,836.60

RESERVE ACCOUNT

Balance @ January 1, 1972	$ 29,069.04
Deposited by Municipality	1,969.03
Interest Earned	1,898.60
	$ 32,936.67
Less Expenditures	-
Balance @ December 31, 1972	$ 32,936.67

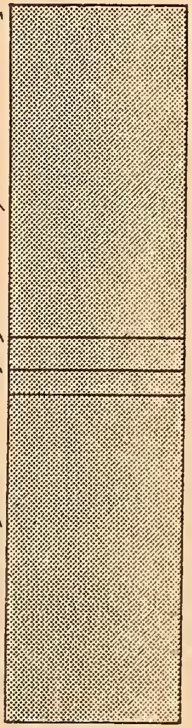
1972 COSTS

OPERATING COSTS



PAYROLL	67 %
FUEL	2 %
POWER	7 %
CHEMICALS	2 %
GENERAL SUPPLIES	3 %
EQUIPMENT	< 1 %
REPAIRS & MAINTENANCE	12 %
SUNDRY	3 %
WATER	NIL %
TRAVEL	3 %

TOTAL ANNUAL COST



NET OPERATING	43 %
DEBT RETIREMENT	6 %
RESERVE	4 %
INTEREST	47 %

YEARLY OPERATING COSTS

YEAR	SEWAGE TREATED in million gallons	TOTAL OPERATING COSTS	TREATMENT COSTS	
			$ per million gal	¢ per lb BOD
1968	72.488	14,885.11	205.35	17 cents
1969	70.21	18,073.73	257.42	13 cents
1970	81.95	19,382.65	237.73	20 cents
1971	81.	20,012.87	246.00	17 cents
1972	95.16	24,077.14	253.00	26 cents

MONTHLY OPERATING COSTS

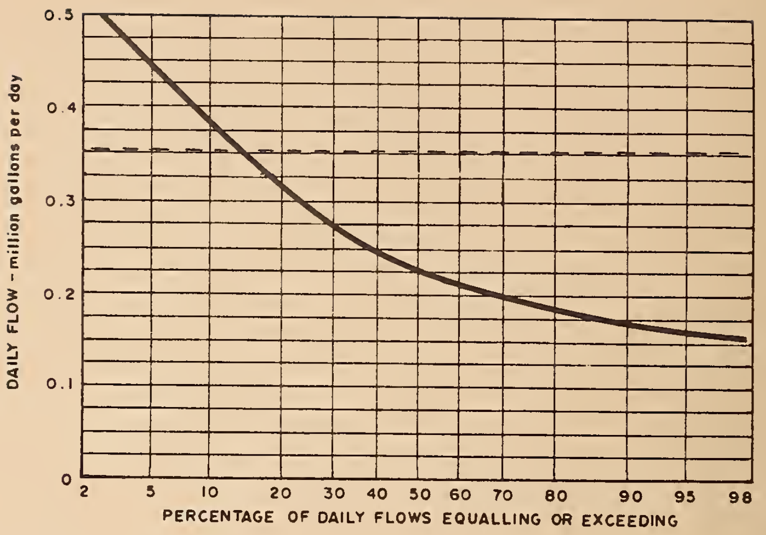
MONTH	TOTAL EXPENDITURE	REGULAR PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY*	WATER	TRAVEL
JAN	1390.11	977.75	238.81		155.70				17.85			
FEB	1283.87	848.81	197.45	59.69	131.40	57.75	79.16		100.22	(237.41)		46.80
MAR	2627.59	795.12	202.82		147.95		23.98		1082.12	292.88		82.72
APR	2006.52	794.41	234.03	73.09	134.35		60.84		599.57	110.23		
MAY	1790.66	1299.59	202.83		166.45		23.89			(19.70)		117.60
JUNE	1797.00	1229.68	245.68	105.26	102.05		71.87			42.46		
JULY	549.77	19.19			124.25	217.50	57.82		56.29			74.72
AUG	1378.71	821.64	158.71	47.38	117.10		191.52		37.15	(54.15)		59.36
SEPT	1606.64	755.29	546.76		128.47		38.00		36.06			64.96
OCT	2152.37	1127.15	474.07		128.47	210.00	37.87		24.33	150.48		
NOV	562.21	38.93		95.19	172.43		59.05		45.00	151.61		
DEC	6931.69	3563.04	1334.88	197.18	104.55		200.76	70.75	937.40	160.35		362.78
TOTAL	24077.14	12270.60	3836.04	577.79	1613.17	485.25	844.76	70.75	2935.99	633.85		808.94

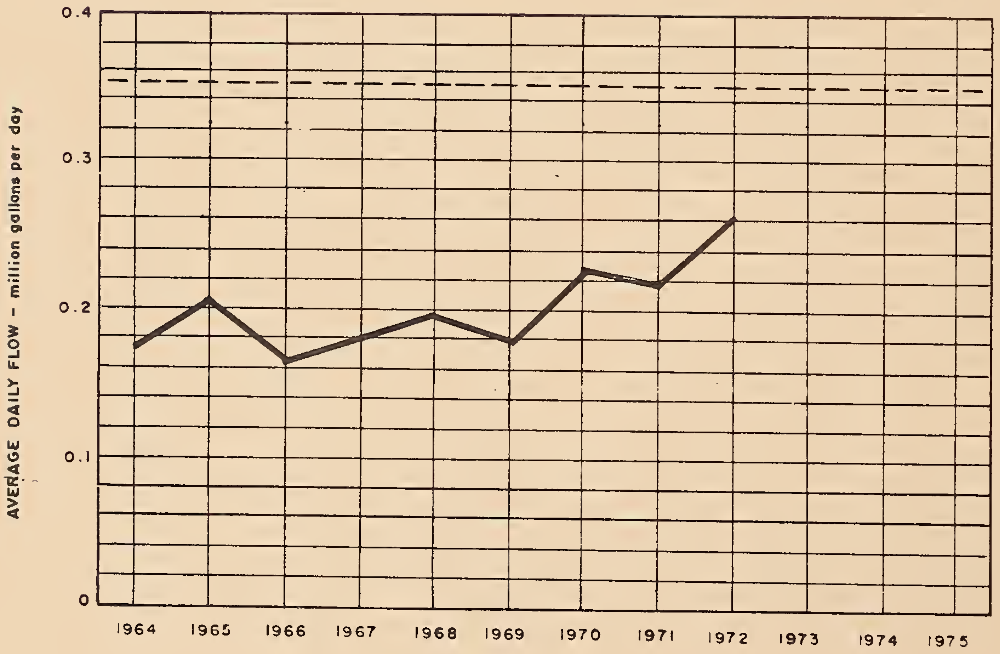
Brackets indicate credit.

* Sundry includes sludge haulage costs of

PROCESS DATA

FLOWS



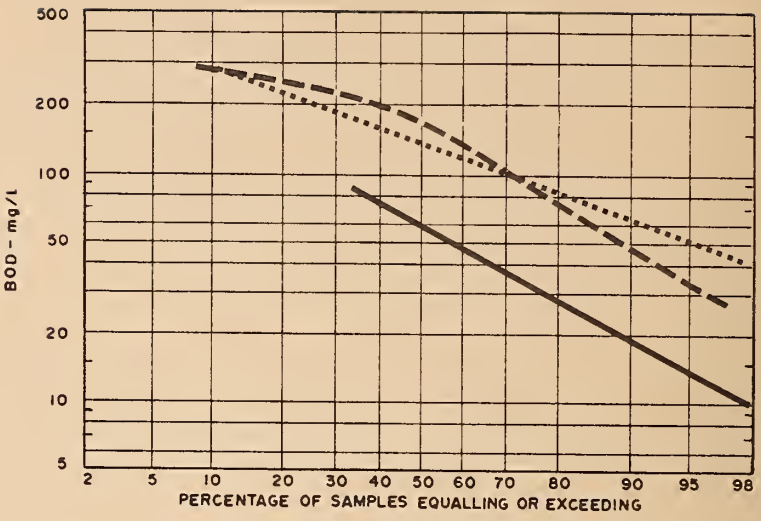


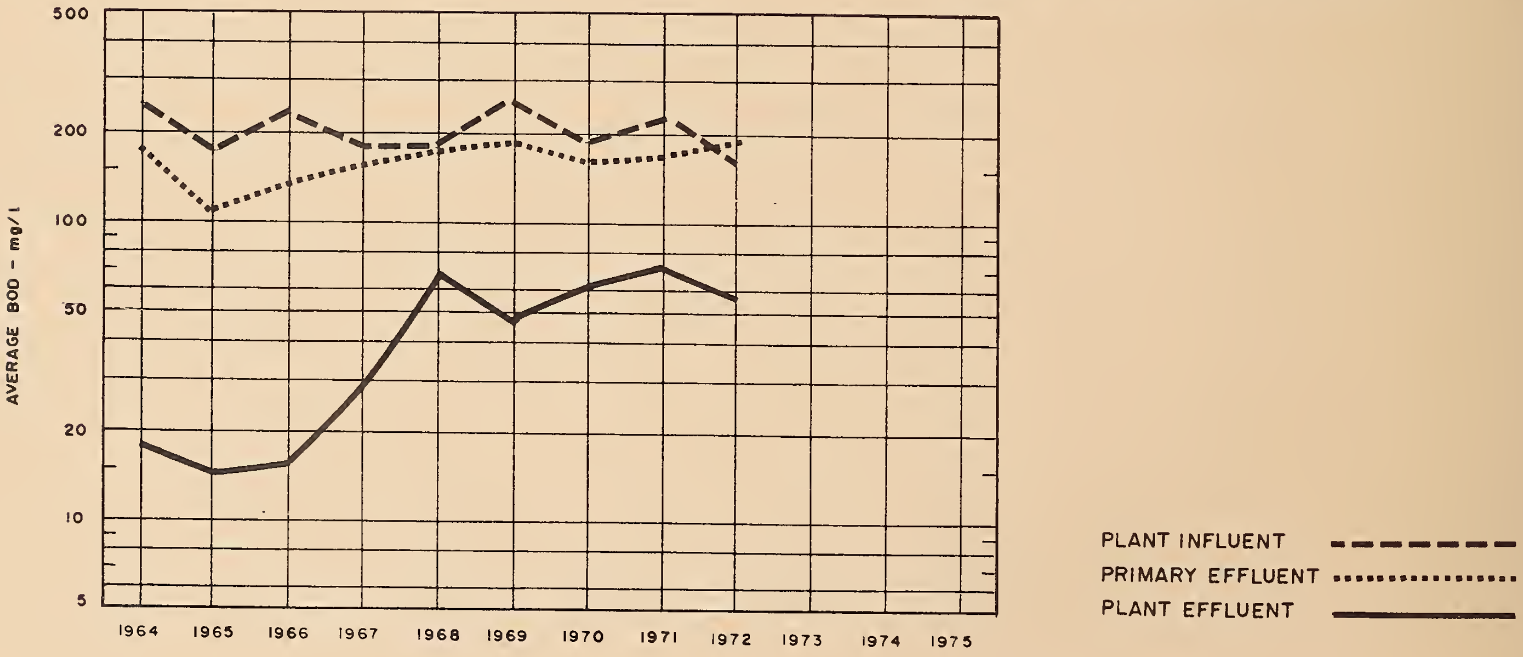
DESIGN CAPACITY - - - - - - - -

PLANT PERFORMANCE

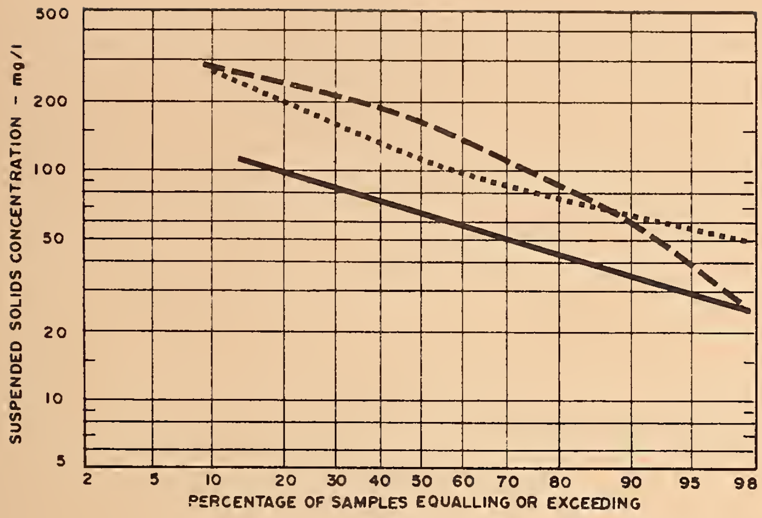
MONTH	FLOWS			BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				PHOSPHORUS	
	TOTAL FLOW	AVERAGE DAY	MAXIMUM DAY	INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT
	million gallons	mil. gal	mgd	mg/l	mg/l	%	10^3 pounds	mg/l	mg/l	%	10^3 pounds	mg/l P	mg/l P
JAN	6.33	.20	.28	180	70	61	7.0	265	67	74	12.5	17.2	6.4
FEB	6.51	.22	.32	140	85	39	3.6	160	100	37	3.9	9.4	5.4
MAR	6.12	.20	.31										
APR	12.40	.41	.55	90	24	73	8.2	220	60	73	19.8	6.2	2.6
MAY	9.50	.31	.49	150	50	67	9.5	100	60	40	3.8	12.0	8.2
JUNE	6.73	.22	.33	50	19	62	2.1	90	60	33	2.0	4.2	2.5
JULY	6.33	.21	.25	220	70	68	9.5	175	55	69	7.6	13.0	6.0
AUG	8.49	.28	.44		95				170				5.5
SEPT	8.64	.29	.54		30				50				4.0
OCT													
NOV				130	12	91		160	30	81		8.1	3.9
DEC													
TOTAL		–	–	–	–	–		–	–	–		–	–
AVG.		.26	MAXIMUM .55	151	54	64	6.7	179	70	61	8.2	11.1	5.2
No. of Samples	–	–	–	9	11	–	–	9	11	–	–	8	10

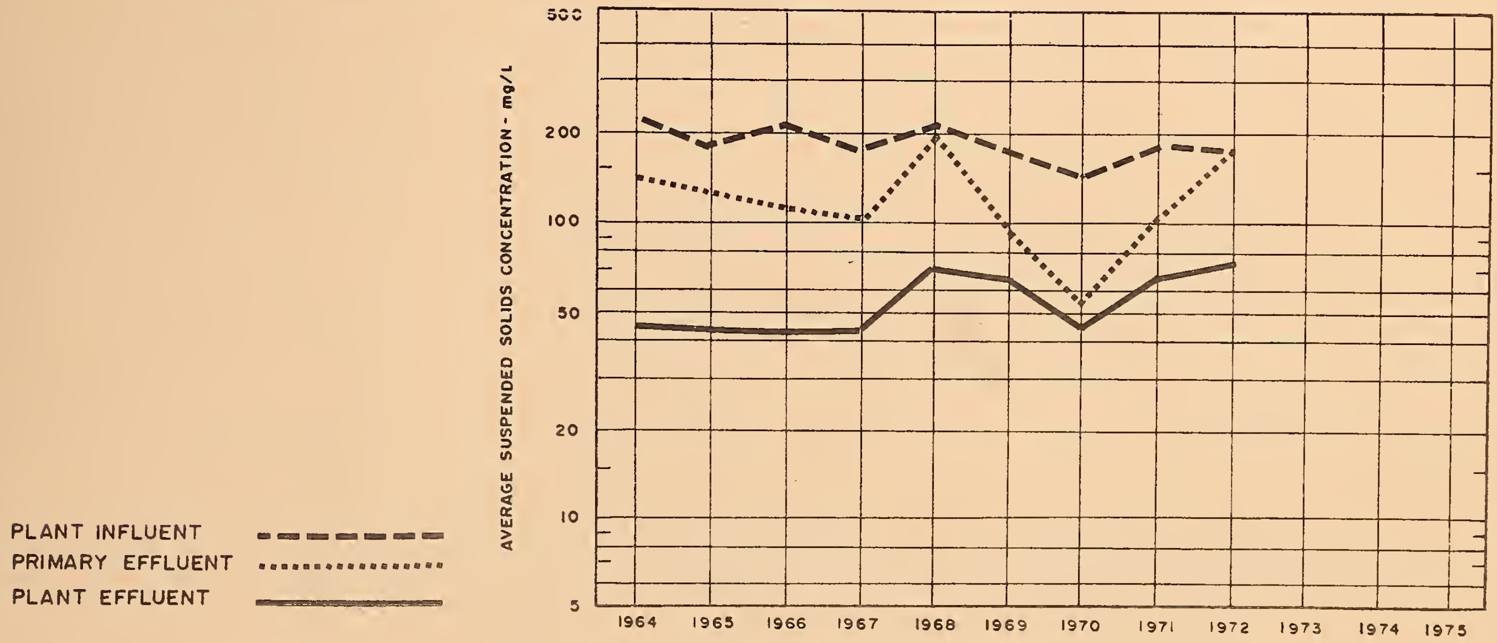
BIOCHEMICAL OXYGEN DEMAND



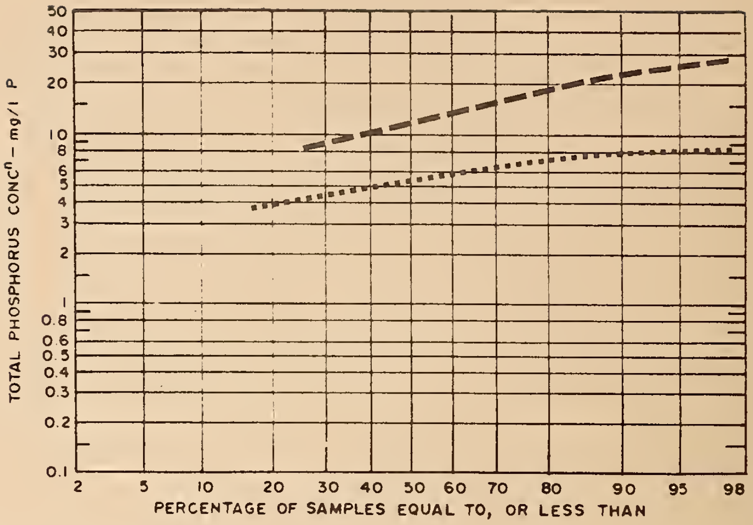


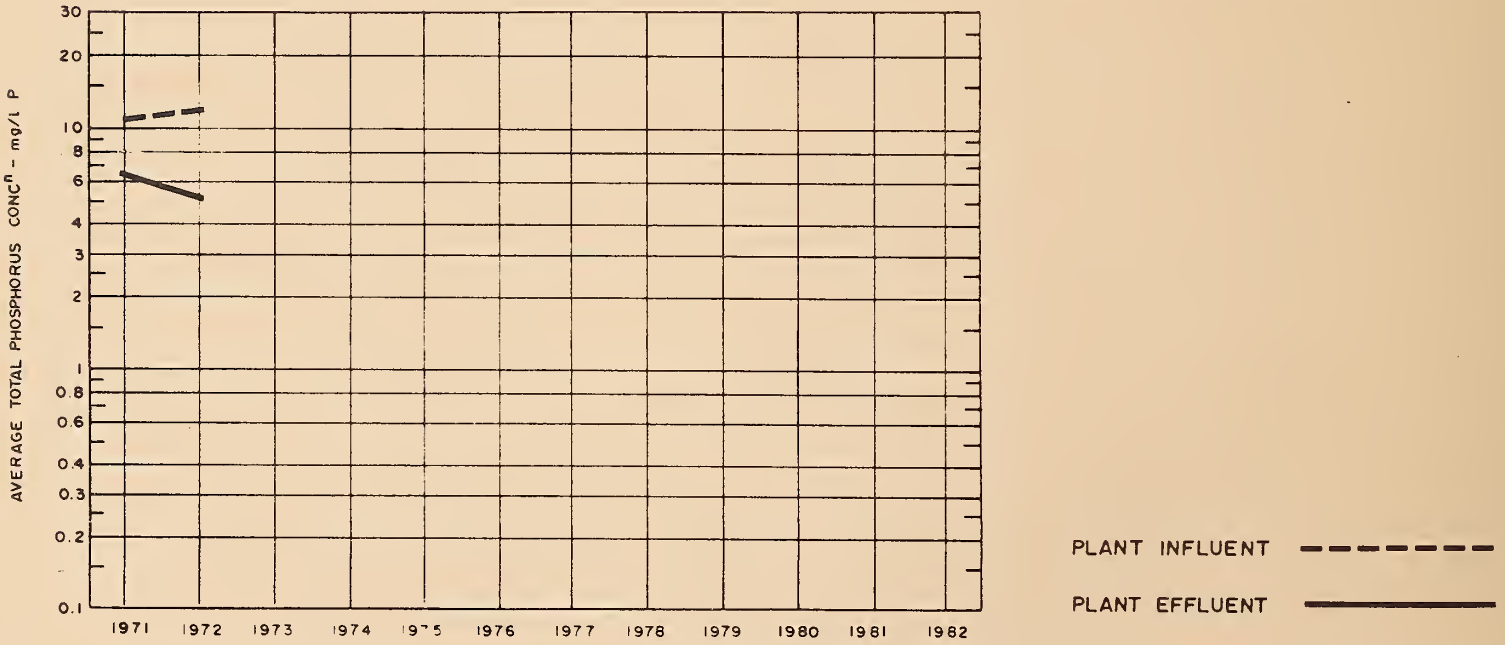
SUSPENDED SOLIDS



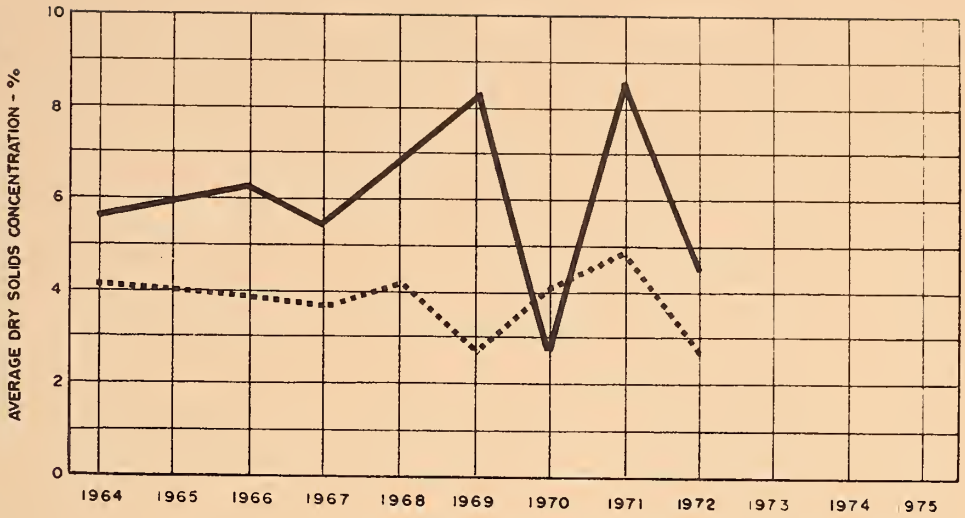


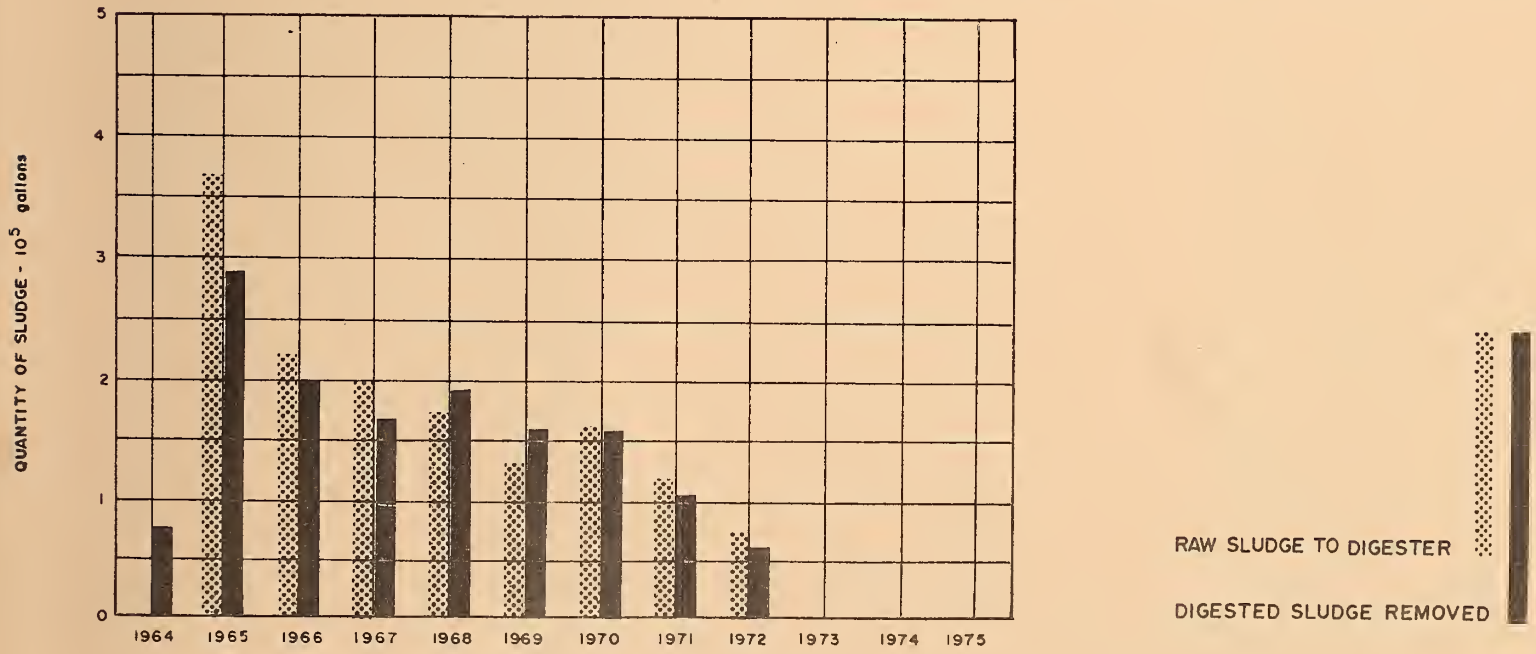
PHOSPHORUS


TOTAL PHOSPHORUS CONCⁿ - mg/l P
50
40
30
20
10
8
6
5
4
3
2
1
0.8
0.6
0.5
0.4
0.3
0.2
0.1
2
5
10
20
30
40
50
60
70
80
90
95
98
PERCENTAGE OF SAMPLES EQUAL TO, OR LESS THAN


AVERAGE TOTAL PHOSPHORUS CONCⁿ - mg/l P
30
20
10
8
6
4
3
2
1
0.8
0.6
0.4
0.3
0.2
0.1
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
PLANT INFLUENT
PLANT EFFLUENT

DIGESTION


RAW SLUDGE
DIGESTED SLUDGE
AVERAGE DRY SOLIDS CONCENTRATION - %
10
8
6
4
2
0
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975


QUANTITY OF SLUDGE - 10^5 gallons
5
4
3
2
1
0
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
RAW SLUDGE TO DIGESTER
DIGESTED SLUDGE REMOVED

TREATMENT DATA

MONTH	GRIT	CHLORINATION		PRIMARY EFFLUENT		AERATION			SLUDGE DIGESTION and DISPOSAL							
									RAW SLUDGE			DIGESTED SLUDGE			SUPER-NATANT	
	QUANTITY REMOVED cubic feet	Cl_2 USED pounds	AVG. DOSE mg/l	BOD mg/l	SUSPENDED SOLIDS mg/l	MLSS CONC mg/l	F/M day^{-1}	AIR $\frac{1000\ ft^3}{lb\ BOD}$	QUANTITY 10^3 gallons	TOTAL SOLIDS %	VOL. SOLIDS %	QUANTITY 10^3 gallons	TOTAL SOLIDS %	VOL. SOLIDS %	T. S. %	AMOUNT HAULED cubic yards
JAN	60			640	555	2200	1.06		14.5	3.0		16.0	4.6		.3	30 a
FEB	75			85	60	2100	.16		14.4			7.5			.4	
MAR	60					1300			8.4			5.8				
APR	45			80	140	1300	.41		1.6	2.7		1.1	2.8		.1	
MAY	35	395	4.6	130	60	150	4.79		1.0	1.4		.8	7.5		.3	45 b
JUNE	45	450	6.7	44	80	210	.82		.5	.6		.7	.4		.4	75 b
JULY	45	465	7.3	150	145	135	4.20		4.3	3.1		2.8	6.3		.3	
AUG	75	494	5.8	140	230	150	4.66		3.5			2.1	4.1		.4	
SEPT	30	455	5.3			85			8.1	5.3		8.5	6.4		.5	15 a
OCT																
NOV																
DEC																
TOTAL	470	2259	–	–	–	–	–	–		–	–		–	–	–	
AVG.	6.6 cu. ft/mil gal	452	5.8	181	181	848	2.30		6.2	2.6		5.0	4.5		.4	

Chlorination period May 3 - September 30

Note: a - from digester

b - from drying beds

Date Due

Ontario. Ministry of the Environment. Plant Operations Branch.

TD227/C66/W38/1972/MOE

Coniston Water Pollution Control Plant.

1972 annual operating summary.

DATE	c.1 ISSUED TO askg

TD227/C66/W38/1972/MOE
Ontario Ministry of the En
Coniston water
pollution control askg
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Environment Ontario

TD
367
.A56
C665
1972

Coniston : water pollution control plant.
81532